**AP Statistics Predicting Heights- Project #2**

**Objective:**

* You will be discovering what body measurement best predicts a person’s height

**Description:**

* For this project you will be working in groups of three, producing only one final product.
* Your group is to come up with three body measurements that you will try to use to predict a person’s height. The three measurements must be easily obtained and will not make any classmate uncomfortable when measured. At least one must be a measure ***around*** a body part.

**Directions:**

* With your group members, decide on your 3 body measurements. Record them on the attached recording chart, or in Fathom
* You will start by measuring the subject’s height first, and then the other three measurements. You will also record the person’s gender.
* You will first practice within your group then one group member will rotate to the other groups to be measured. Each member will have a turn to be measured by the other groups. Once that person is done, they will come back and switch, so that the other members can go around & be measured. By the end you should have collected measurements on every student in the class.
* We will have at least 2 guest teachers who will get measured **EXCEPT THEIR HEIGHT**. You will be **predicting** their heights from your data analysis.
* Once you have completed your recordings, you are to put the data into Fathom.
* You should create a linear model for each of the body measurements versus height. Always check residual plots to see if the models are appropriate!
* Once you have the best model check to see how well the model predicted the height for each of your group members. (use your model to predict height, and then find the residual for each group member)
* Create your power point

**Presentation:**

* Your group will be presenting your findings to the class, in the form of a power point. The presentation should include:
  + Title slide
  + Introductions slide: description of **WHAT** three measurements were collected and **HOW** they were collected
  + For ***each*** measurement: scatterplot, LSR line on plot, residual plot, r, and r2. Be sure to **describe** the scatterplots, interpret the slope, interpret r2, and explain what the residual plot tells you about the fit of the linear model.
  + For ***each*** measurement: separate scatterplot with GENDER on it, and **discussion** of the differences between the two genders.
    - Include comparison of: both slopes, both correlations, both r2, and a general description of the differences in the gender
  + The best model (LSRL) chosen by the group with **justification** for that choice
    - Justification: use residual plot, r and r2, gender differences.
    - You can pick a different model for males vs. females if you want to
  + Use your chosen “best model” to predict each group members’ height, and calculate residuals for each member (be sure to ***show work*** on how these were calculated)
  + Use your “best model” to predict the heights of our **guest teachers** (show work!) and then ***discuss*** your confidence in your predictions
  + Identify any sources of bias/error
  + Conclusion slide
* Presentation should be about 5-8 minutes long. All slides should be printed (6 per page) and turned in.

**AP Statistics**

**Body Measurement Data Variable 1 Variable 2 Variable 3**

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| Subject | Height |  |  |  | GENDER |
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**AP Statistics Group Members: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Predicting Heights Project \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Rubric**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**ITEM POINTS DEDUCTED**

Description of how the project was completed \_\_\_\_(5)

Three body measurements with at least one a circumference \_\_\_\_(5)

Model #1 – Scatterplot, LSR line, r, r2 \_\_\_\_(13)

Residual Plot w/ description

Description of plot, interpretation of slope, r, r2

Differences in Sex with discussion

Model #2 – Scatterplot, LSR line, r, r2 \_\_\_\_(13)

Residual Plot w/ description

Description of plot, interpretation of slope, r, r2

Differences in Sex with discussion

Model #3 – Scatterplot, LSR line, r, r2 \_\_\_\_(13)

Residual Plot w/ description

Description of plot, interpretation of slope, r, r2

Differences in Sex with discussion

Choice of best model with reasoning \_\_\_\_(7)

Predictions and residuals for each group member \_\_\_\_(6)

Prediction of teacher #1 height \_\_\_\_(3)

Prediction of teacher #2 height \_\_\_\_(3)

Confidence in predictions & why \_\_\_\_(5)

Bias & Error \_\_\_\_(5)

Presentation- done in PowerPoint, clear, organized, slides printed \_\_\_\_(5)

All members participate in presenting information \_\_\_\_(8)

Appropriate time (5-8 minutes) \_\_\_\_(5)

Introduction & Conclusion slides \_\_\_\_ (4)

Total \_\_\_\_(100)